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**COMMUNITY MOBILIZATION IN
SANITATION PROJECTS:
A Case Study of Maina Village**

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LIST OF ABBREVIATIONS

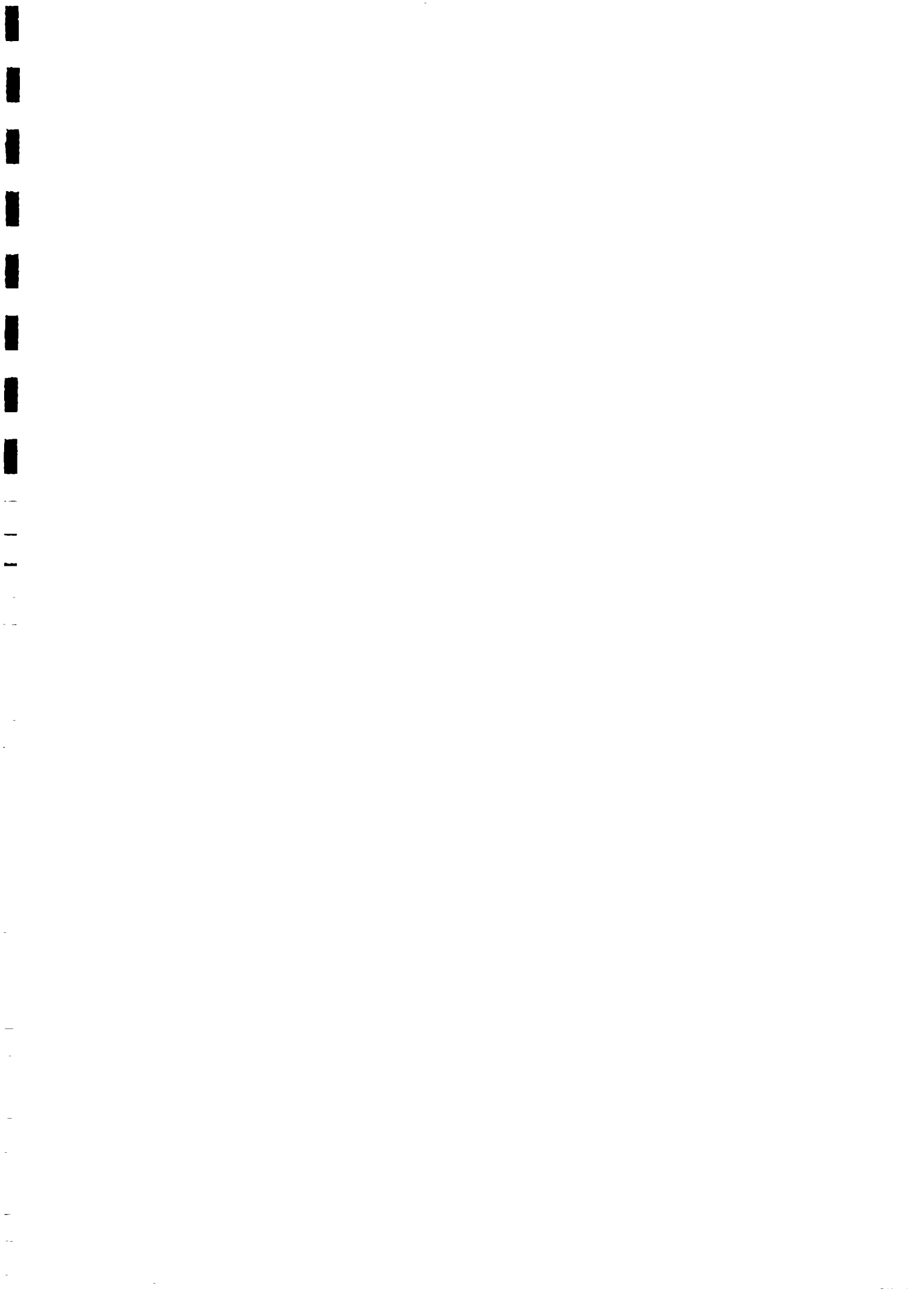
1 US\$ = Ksh 35

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|--------|---|
| DANIDA | Danish International Development Agency |
| KWAHO | Kenya Water for Health Organization |
| UNICEF | United Nations Children's Fund |
| RSUs | Residential Sanitation Units |
| NMC | Nyahururu Municipal Council |
| PCEA | Presbyterian Church of East Africa |
| NGOs | Non Governmental Organizations |
| GOK | Government of Kenya |
| LGLA | Local Government Loans Authority |
| MOLG | Ministry of Local Government |
| DKK | Danish Kroner |
| VIPs | Ventilated Pit Latrines |
| Ksh | Kenya Shillings |

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Maina Village from the main street, Area I to the left and Area II to the right.



People queing for water from a spring within Maina Village



In some instances landlords agreed to demolish rental space to give room for the toilets



Water points were moved to washing slaps constructed next to the toilets

EXECUTIVE SUMMARY

Maina village, an informal settlement inside the municipal boundaries of Nyahururu town in central Kenya, was established in 1965 for ex-servicemen of the King's African Rifles. The original 20-year leases expired in 1985 and were not renewed until 1992, when 99-year leases were granted. The settlement started as a small village inhabited mostly by male migrant workers but over the years expanded to accommodate a population of 14,000. Despite its rapid growth, Maina retained its "informal" status due to the 20-year lease period, with little or no development of infrastructure and services until 1985, when a DANIDA-funded project provided for the construction of sewerage and sanitation facilities.

The Maina Village Sanitation and Sewerage component was one of several activities carried out in Nyahururu during the second phase of DANIDA Sewerage House Connection project (1975-1991). The component included a sewer line, plot connections (water and sewer), on-site sanitation, low-cost roads, storm drains, and a community-based solid waste collection system. Although the second phase of the project was commissioned in 1985, actual project work did not begin until 1987, and in the case of Maina work did not begin until 1988.

Three factors led to these delays: 1) uncertainty over land tenure -- the 20-year leases granted to Maina residents in 1965 had expired; 2) disagreement between the project and the municipality regarding the physical plan -- the plan drawn up by the council did not reflect the situation on the ground; and 3) lack of community involvement in project planning, which created apprehension about the project and resistance to planned activities.

As part of regular monitoring and evaluation activities, a mid-term review of the project was undertaken in February/March 1989. The review team found that there was community resistance to the project and suggested ways of alleviating fears and enhancing community participation. These included creating a community-based site committee, involving community services and health extension workers more closely, and contracting an NGO -- Kenya Water for Health (KWAHO) -- to carry out community mobilization activities. By mid 1989, KWAHO staff were in place and by late 1989, the site committee was expanded to include community representatives.

The second review mission carried out shortly before the project was scheduled for completion in February 1991 noted substantial progress in project implementation. In addition to physical achievements, the community, with KWAHO support, had agreed to provide the project with physical and material inputs and to participate in the maintenance and management of facilities. KWAHO also helped to ensure that the construction did not outpace the community's capacity to absorb the proposed developments and that the infrastructure developed under the project would provide maximum benefits to the community.

Implementation of the project was carried out in three phases in three distinct areas of the village. Initial activities in Area I (see map 1) were aimed at establishing the project's viability; if successful, these activities would expand to cover Area II. Area III, which fell below the sewer line, was not initially included in the project because connections to the sewer line could not be made.

Work in Area III was only initiated near the end of the project when planners saw that health benefits in Areas I and II could not be realized unless sanitation improvements were made throughout the village. A Ventilated Pit Latrine (VIP) construction component was therefore included for Area III, with villagers participating in the construction of superstructures.

Shortly before the end of the project in September 1992, events in Maina village threatened to jeopardize the entire project. Following a presidential directive in March 1992, 99-year leases were granted to plot holders in Maina. Not long afterwards, the Nyahururu Municipal Council revealed that a new physical plan had been prepared for the village. If fully implemented, the new plan threatened to displace or unsettle residents of Maina by requiring an increase in plot size from 30 x 60 feet to the standard 50 x 100 feet, and demolition of some housing to make room for roads and public facilities (police station, post office, etc). The plan also proposed expanding the village to include an additional 500 plots in the low-lying area below the sewer line. These plots would accommodate persons displaced from the original village.

During a site visit by DANIDA officials and the authors in mid-1992, it was observed that the proposed changes would lead to displacement of community members served by the project, and the destruction of much of the infrastructure put in place by the project. Further, expansion of the village to the unsewered low-lying area would necessitate the construction of additional sanitation facilities in the marshy areas close to a tributary serving the municipal water intake. It was noted that overall health benefits derived from the project would be lost unless the government provided sufficient controls in terms of specifying and regulating the development of appropriate sanitation infrastructure in order to counteract the difficult environmental conditions.

Although the project was coming to a close, DANIDA, the project team, the municipality and the community agreed to continue discussions until they reached agreement on ways of maintaining the infrastructure put in place through the project. It was agreed that after a team of surveyors prepare a new physical plan showing the actual situation in the village, before decisions be made about the scope and nature of changes to the village and requirements for its proposed expansion. It was agreed that all new developments would be geared toward enhancing the project's achievements.

Finally, it was proposed that KWAHO should remain in Maina during the transition period to keep the community informed and involved in decisions about proposed changes and to continue mobilizing the community to finalize the improvements (mainly construction of superstructures) and to maintain and manage the facilities developed under the project.

In the year following the conclusion of the project, preparations are still underway to finalize the new physical plan. The NMC has indicated that few changes to the existing village will occur and these will be made to accommodate physical infrastructure such as roads. The NMC has also indicated that the concerns regarding construction in the area adjacent to the stream will be partly taken care of by the introduction of strict regulations regarding the type of sanitation to be allowed in the area (ie to prevent construction of pit latrines). Construction is now being allowed only if provision for a septic tanks or cess pool is made.

Lessons Learned

The main lessons learned from the project are:

- * **Risks associated with land tenure should be well understood and accounted for in project planning.**
- * **An integrated approach to project planning will give better results and ensure sustainability.**
- * **Raising a community's awareness and incorporating its views, ideas and knowledge in project design significantly increases commitment, ownership, and sustainability.**
- * **Training and health education are important elements of sanitation projects.**
- * **Implementation arrangements made by donors and project managers should be adaptive and flexible to enable rapid response to problems that arise during project implementation.**

The following sections of the case study expand on these lessons and explore the role of community mobilization and training in facilitating project implementation. Primary attention has thus been given to the views of users of the newly installed facilities.

Chapter I.

MAINA VILLAGE

This section gives an overview of the historical, physical, demographic and socio-economic conditions of Maina village, as well as a review of infrastructure and services - water and sanitation.

Historical and Physical Characteristics

Maina village, an informal settlement formed in 1965 for ex-servicemen of the King's African Rifles, took its name "Maina" from the Kikuyu custom of naming groups of agemates: most inhabitants belonged to the "Maina" age group. The original residents were granted 20-year leases which expired in 1985. These were not renewed until 1992, when 99-year leases were granted.

The village began as a small settlement of mainly male inhabitants, some of whom eventually married, thus starting a new life order in the village. As the population grew, the need for residential units arose, prompting some residents to construct rental accommodation (rooms) for interested tenants. The village expanded rapidly and its population density has increased several times.

Maina is situated about 2 kilometers west of the Nyahururu Town Center along the Nyahururu-Rumuruti Road in Kenya's Central Province at the northern tip of Nyandarua District. Nyahururu Municipality is the largest urban center in the district with about 30,000 people. Maina village is a high density, unplanned area outside Nyahururu town but within its municipal boundaries, occupying an area of about 1 km². It is surrounded by forests and fertile agricultural land.

Nyahururu lies in the central highlands near Mt. Kenya (see map 2). The terrain around Nyahururu municipality is generally flat but Maina is located on a slope on the eastern bank of Gathare stream, a tributary of Ewaso Nyiro river and the main water source for Nyahururu Municipality. The upper portion of the village close to the Rumuruti-Nyahururu road is fairly steep, while the low-lying area near the stream is swampy and has a high water table.

The municipality lies in a potentially productive agricultural zone with an annual rainfall of between 1,800mm-2,400mm. Temperatures range from 5°C during the cold season to 26°C during the hot season, and the rainy seasons last from April to June and October to December.

Black cotton soils, which predominate in the Maina area are non-porous and sticky when wet but fertile and suitable for agriculture. Due to sloping topography, poor drainage, and the high water table -- 0.5 to 1.5m below ground level especially in Areas III and IV (see map 1) -- makes construction in this area fairly expensive.

As a result of poor drainage, the low-lying areas around Nyahururu become waterlogged several months yearly, creating breeding conditions for mosquitos and other waterborne insects and parasites. Runoff from Nyahururu town makes its

way southward into the low-lying areas bordering the stream. A drainage network constructed in the low-lying area during the 1960's has not been well maintained.

Demographic and Socio-Economic Characteristics

Although the village started with a population of about 1,000 inhabitants, it now has a population of about 14,000 which is about half of Nyahururu's population. Fifty percent are children (15 years and under), while 30 percent of adults are women and 20 percent are men (KWAHO, 1992). The average household size is eight, and the majority of female headed households are single mothers with unstable jobs and incomes.

The population of this area remains predominantly Kikuyu (95 percent), although over the years people from other ethnic groups have moved into the area: Luhyas 2 percent, Luos 1 percent, and Kisii 1 percent. The remaining 1 percent is split between various ethnic groups.

Most village residents derive their income from casual labor on nearby farms. Some are employed in the National Pencil Company and in saw mills, while others work in the service industry in Nyahururu (mainly in households and hotels, and as low-skilled workers in the municipal and district administration and the business community). Since most are casual laborers, they do not have steady incomes; daily incomes are low, ranging from Kshs 60 to Kshs 90 (2-3US\$).

Many residents also derive income from various other economic activities including small-scale commercial farming. The main crops are maize, beans, potatoes, and other vegetables, and livestock include goats, cattle, turkey and chicken. In addition, Maina has about 40 retail shops, hotels, butcheries, bars, an open air market and a posho mill. Residents also engage in charcoal burning and brewing of illegal liquor.

Several self-help groups in Maina (see next section) carry out income generating activities including bee-keeping, tailoring, knitting, farming, merry-go-round¹ and lotteries. Most are women's groups with an average of 30 members who share the benefits of such income-generating activities. A Village Health Committee, established by villagers in 1984 to promote village hygiene, cleans and maintains the storm water drains and mobilizes other community members to join them in keeping the village clean.

Maina has three nursery schools, each with about 100 pupils. The two primary schools, Maina Primary School (850 students) and Thama Primary School (550 students), accommodate a total 1,350 students. Since the two schools cannot accommodate all primary school-going children, other village children attend school in Nyahururu town. Maina has no secondary schools. An adult literacy class is held in the village once a week.

Recreational facilities are scarce. Schoolchildren have access to a playground in Maina Primary School but only during the school term. Since there are no other playgrounds in the area, children play on the roads and in the swampy fields below the village. The village has no community halls, and most meetings are held in the open air. Adult recreation facilities are limited to bars.

¹ A rotational fund

Religious sects represented in Maina village include the Catholic Church, P.C.E.A, Baptist, African Inland Church, Evangelistic, Full Gospel, Assemblies of God, Independent Church, InterChristian, Apostolic, Akorino, Salvation Army and Divine denominations. Only three denominations -- Baptist, Catholic, and P.C.E.A. -- have built churches in the village.

Infrastructure and Services

Along the main Nyahururu-Rumuruti Road, residents have access to transport facilities including matatus² that regularly serve the area. A main road cuts across the village and several feeder roads lead into it. Refuse tips located along these feeder roads are easily accessible to municipal refuse collection vehicles.

About 94 percent of village houses are made of semi-permanent materials, mainly timber walls and corrugated iron roofing sheets. About 50 percent have concrete floors (KWAHO, 1992). Most houses are in fair condition. The distance between buildings varies from 1 to 5 metres, and each plot has an average of 10 rooms, most of which are occupied by tenants. Most landlords no longer live in the village.

Monthly rents range from Kshs 80 to Kshs 250 per room, though rents have increased slightly due to the improvements in village infrastructure made through the project. The average room size is about 10m², with each family renting a maximum of two rooms. Overcrowding is a problem in the village -- some rooms accommodate up to 30 persons.

Maina's only Government dispensary has two community nurses, one clinic staff member and a District Council public health technician assigned to it. There are also two traditional healers in the area. Common diseases diagnosed and treated include malaria, upper respiratory tract infections, diarrhoea, gonorrhoea, mumps, chicken pox, pneumonia and rheumatism. Many illnesses are related to unsafe water, poor sanitation and exposure to cold weather. Annexes 1 and 2 show the types of diseases and cases per month in 1990 and 1991.

The village is served by a protected spring and piped water from the municipality. The spring was the main source of water until 1982, when piped water was connected to the village. Some households still rely on the spring, which, though protected with UNICEF support in 1986, is now in poor condition: all the taps have been stolen, so people must collect water from an overflow pipe. Children use hose pipes, which are often unclean, to extract water from the overflow pipe, thus posing a health risk to the entire community. Access to piped water enabled household connection to sewer under the project.

Prior to the project, liquid and solid waste was also poorly managed -- garbage, solid waste and human faeces were dumped in heaps along the roads and in every corner or open space in the village. Irregular collection services provided by the municipality have worsened the problem and this continues to hamper the

²Matatus are the most widely used means of public transport in Kenya. Literally translated, "Matatu" means three [thirty cent coins], the fare charged by these vehicles years ago.

village health committee's clean-up activities. Sludge from overflowing pit latrines, particularly during the rainy seasons, was not well contained or drained, allowing wastes to flow through natural drainage channels into the low-lying area below the village.

Chapter II.

THE SEWERAGE AND SANITATION PROJECT

This section describes the project phases leading to the Maina Village Sanitation and Sewerage component. It describes activities carried out from 1975 to 1992 within Nyahururu Municipality and particularly in Maina Village.

Phase I: Sewerage Systems - 1975 to 1985

DANIDA involvement in Kenya's sanitation sector began in February 1975, when the DANIDA board approved a grant of Ksh 840,000 to the Ministry of Local Government (MOLG) - Planning Team for preliminary engineering studies of sewerage systems in six urban centers: Homa Bay, Nyahururu, Busia, Eldama Ravine, Wundanyi and Lamu (later replaced by Isiolo). On the basis of these studies, an agreement was made in 1977 to provide support for Isiolo, Homa Bay, Nyahururu and Busia.

From 1977 to 1985, DANIDA granted DKK 38.9 million for the construction of sewerage systems and sewerage treatment works in Busia, Homa Bay, Isiolo and Nyahururu. The four DANIDA-supported sewerage systems were commissioned as follows: Isiolo in June 1983, Busia in September 1983, Homa Bay in July 1984 and Nyahururu in May 1986. Despite initial estimates, which aimed to cover 100 per cent of the project with Danish grant funds, about 47 percent of the total costs of the four sewerage projects were eventually covered with the grant allocated for this purpose. The remaining 53 percent of costs was financed locally by loans from Local Government Loans Authority (LGLA) to the relevant local authorities.

Phase II: Sewerage House Connections - 1986 to 1992

Near the end of the first phase, it was realized that in order to maximize benefits of the new sewer systems and make them economically viable, it would be necessary to construct sewer connections in industrial, commercial, institutional and residential areas. Comprehensive house connection surveys conducted in 1983/84 detailed the need for 1) connecting as many plots as possible within a reasonable and feasible distance from the already constructed trunk sewers; and 2) constructing a number of service lines. The report also identified the need for financial arrangements for individual plot owners to build in-house facilities (toilet and washing installations) where such facilities did not exist.

A 1984 appraisal of the project recommended additional financial and technical assistance to construct about 1,000 plot connections to trunk sewers and some service lines to increase the population served by the sewerage schemes in the four towns from about 18,900 people (in 1985) to about 43,800 people by the end of the project. An agreement to carry out a sewerage house connection project was signed in June 1986. The grant amounted to DKK 23.4 million plus

the services of three DANIDA advisers, a project coordinator based in MOLG in Nairobi, and two project engineers stationed in Busia and Nyahururu.

Although this second phase focused on construction of sewerage house connections by local contractors, it also aimed to strengthen the technical and administrative capacity of the four local councils. The aim was to build local capacity in the construction sector while improving the municipality's technical and financial management of sewerage services.

Maina Village - Sewerage and Sanitation Component

The second phase of the project, also included a component for improving Maina's roads, stormwater drainage and waterborne sanitation, and eventually for providing a solid waste collection system and on-site sanitation in low lying areas below the sewer line. The project was to cover the areas above the sewer line, Areas I and II, but was later extended to the area below the sewer line, Area III (see map 1). Maina's main access road cuts through the village, separating Area I, which lies on the eastern side of the access road, from Area II on the western side of the road. The sewer is the dividing line between areas I and II, and area III which is situated in the low-lying part of the village.

The component was to begin in 1986 with a pilot phase in Area I, which would determine whether Areas II and III should be developed, but implementation was delayed due to the insecurity of tenure in the village -- the 20-year leases had expired in 1985, and the NMC and DANIDA had failed to agree on a physical plan that ensured security of tenure to Maina residents. The DANIDA advisers indicated that work should not begin unless there was agreement with NMC regarding the long-term status of the village, particularly with regard to the physical plan and villagers who had not been informed of the projects intentions became increasingly suspicious.

By 1988 only a trunk sewer along the main village road and a few lateral sewers in Area I had been constructed; four demonstration Residential Sanitation Units (RSUs) were constructed shortly before the arrival of a mid-term review team in February 1989. It became clear during the mid-term review that this work had taken place without community input. The review team noted that there had been no consultation or involvement of the community during the construction of the RSUs, and neither the local chief nor the village health committee had been contacted. As a result, the villagers, who were unsure of the project's motives and feared the loss of their plots, resisted the project engineers' proposal to adjust the layout of some plots to enable expansion of the roads, storm drains and RSUs.

At a steering committee meeting held during the visit of the review mission, it was agreed that the physical plan for Maina village, prepared by the municipal council, should be adjusted to depict the actual layout of structures. The revised physical plan would then become a precondition for DANIDA's investment in Maina. It was hoped that this would ensure that investments made under the project would not be lost (the Council's earlier physical plan implied large scale demolition of existing structures) and that Maina residents would not be displaced. To strengthen the community's commitment and involvement, a site committee would be formed to ensure community participation in project planning and implementation and closer involvement of extension workers from MOH and

MOCSS. It was also agreed that KWAHO, a local NGO with extensive experience in community mobilization in the water and sanitation sector, would be engaged to provide community mobilization services to the project (see Chapter IV).

Finally, to ensure the sustainability of the sewerage house connection project, 12 hectares of land in the low-lying areas around Nyahururu Municipality were set aside for afforestation to create a buffer zone between the municipality and bordering water bodies. 8 hectares were planted with eucalyptus trees by the end of the project.

Chapter III.

INSTITUTIONS & INSTITUTIONAL ARRANGEMENTS

This section, which describes the roles and responsibilities of various institutions and committees in implementing the project, sets the stage for the Community Mobilization section, which reviews the roles of KWAHO in building community participation.

Institutional arrangements for project implementation varied from Phase I to Phase II: Phase I was a construction-intensive phase involving specialized technical expertise, while Phase II focused on small-scale construction by local contractors and technicians with some technical supervision. The community-based component in Maina village required community inputs -- resources, labor, maintenance and management -- during and following the construction of physical inputs.

The principal institutions involved in the second phase of the project were the NMC, which had overall responsibility for the project; DANIDA, the funding agent, which was responsible for providing technical assistance to the project; the Nyandarua District Council (NDC), which kept links to the central government, mainly the Ministries of Local Government and Lands and Housing, and provided technical support to the project; the steering and site committees, which were formed to oversee and guide implementation; and several community organizations, which were involved in their various capacities as representatives of the community.

Nyahururu Municipal Council

As the administrative arm of local government in Nyahururu, NMC has overall responsibility for the project. The town clerk, town engineer, sewerage superintendent, sewerage operator, and the physical planner among others, provided technical assistance in planning and implementing the sewerage house connection project. NMC also provided office space to DANIDA and KWAHO officers involved in the project and gave support to the project team whenever necessary.

Through organizations such as UNICEF, NMC has facilitated seminars, workshops and training sessions on community health for the residents of Nyahururu town, which also benefitted the residents of Maina village. Despite the insecure land tenure situation in Maina, NMC continued to encourage the residents to participate actively in the project. This encouragement from the NMC created a feeling of security among community members, thereby increasing their commitment to the project. NMC will continue to provide necessary support to the community in the post project phase to ensure that project inputs are not lost.

Danish International Development Agency (DANIDA)

In addition to funding the project, DANIDA provided technical assistance through a project coordinator based in MOLG in Nairobi and a project engineer stationed in Nyahururu. These two officers remained with the project until June 1991. After the project was extended to incorporate Area III, Carl Bro were appointed as engineering consultants, and a full-time engineering assistant was assigned to the project site.

DANIDA also appointed KWAHO as consultants for community mobilization and training (see Chapter IV.) and engaged the UNDP/World Bank-Regional Water and Sanitation Group in several project review missions. The findings of the review missions have been used to monitor project progress and make adjustments where necessary. As funding agency, DANIDA, which participated in regular evaluations of the project, demonstrated a consistent flexibility that contributed to the project's successful implementation.

Nyandarua District Office (NDC)

The Nyandarua District Office provided the links between MOLG, the client ministry, and was responsible for coordinating project activities in the other towns. The Government district officers involved in the project include the district public health officer, social workers, district officer for environment and the lands officer. Staff from the district office have been involved in various stages of the planning, implementation and management of the project.

Steering Committee

This committee was formed at the initiation of the project, and comprised of NMC representatives including the Mayor, heads of NMC departments, the DANIDA project engineer, senior programme officer of KWAHO, the chief, and the councillor of Maina village. The committee's responsibilities included reviewing the achievements of the project at each of the meetings as well as ensuring proper communication among those involved in project implementation.

One of the main functions of the committee was to provide policy guidelines on project implementation taking into account the opinions of all interested parties. It provided input on the physical plan of the village, and negotiated with the community on various aspects of project implementation, including the decision that landlords were to sign agreement forms before connections were made to the sewer line.

The steering committee held regular meetings at least once every two months, and these continued until July 1992 shortly before project completion.

Site Committee

The site committee was formed after the mid-term review mission to assist the various parties in dealing with community conflicts during the implementation period. Its 15 members included landlords, tenants, the assistant chief, headmistress of Maina Nursery School, municipal officials, the KWAHO

community extension officer, the village public health technician, community health nurse, social welfare officer, and case workers. As representatives of the community, this group functioned as a link between the beneficiaries and the project implementation team on issues requiring community input. The terms of reference for the site committee included:

- acting as a link between the beneficiaries and the project implementation team;
- monitoring implementation of the project;
- making decisions about developments in the project;
- identifying other issues that could help project implementation;
- informing and mobilizing the community;
- helping to establish a community organization for refuse collection and disposal; and
- maintaining cleanliness in the village.

The site committee focussed on establishing strategies for project implementation and creating communication channels between the community and the project steering committee. It was instrumental in mobilizing the community and ensuring that community decisions were implemented by the project team. Only two individuals were represented on both the steering and the site committee - the Chief and the Community Extension Officer from KWAHO. Both acted as a link between the steering committee and the site committee, ensuring that the decisions of each were communicated to the other.

Chapter IV.

COMMUNITY MOBILIZATION AND TRAINING

This section reviews the role of KWAHO in community mobilization and describes the importance of this component in project implementation. The roles of the various community groups are also highlighted.

Kenya Water for Health Organization (KWAHO)

Founded in 1976 as a UNICEF/NGO Water for Health project, KWAHO was registered in 1983 as an NGO under the Societies Act with the goals of: assisting communities to get safe, easy access to clean water; improving the standard of living through appropriate health/hygiene and sanitation measures; and enhancing project beneficiaries' self reliance and confidence through community participation in project identification, planning, implementation and maintenance.

On April 21, 1989, DANIDA and KWAHO entered an agreement in which KWAHO was to provide support services in connection with the Maina Village Sewerage and Sanitation component. Two officers participated in the project: a part-time senior programme officer based in Nairobi and a full-time community extension officer based in Maina village. KWAHO's role was to mobilize the community and train villagers in the importance of health and management of solid waste. Its specific goals were to identify the role and responsibilities of the community in project implementation and management; to facilitate community mobilization; to help coordinate the physical development of the project; and to build an organizational structure at the community level that would ensure sustained utilization of the infrastructure with maximum benefit to Maina's population.

To fulfill these responsibilities, KWAHO required an understanding of the social organization of Maina village. Through discussions with the community, KWAHO noted that women's groups formed the majority of community groups and would therefore play an important part in the project. An existing village health committee created a good entry point for KWAHO and led to the formation of the Kihato Women's Group, a coalition of village women's groups involved in health activities (maintaining drains, solid waste cleanup, etc.).

KWAHO also held meetings geared toward informing the community about the project's goals and residents' role in project implementation and played a liaison role in communicating the community's views to the project team, steering and site committees. For example, the idea of communal washing slabs in Area III was dropped after community dialogue with KWAHO, and the Council deployed a refuse collection truck to the village after a suggestion from the community channeled through the site committee. Decisions from community awareness meetings regarding the anticipated or perceived effects of the project were also communicated to the steering committee.

Throughout the project, KWAHO ensured coordination among the project team, NMC authorities and the district office. KWAHO and the Municipal Cleansing Department liased on ways to extend services to the village; key council representatives (e.g., the mayor) were invited to participate in discussions with village community groups, and the acting chief acted as the facilitator to ensure smooth running of community meetings.

KWAHO, in collaboration with the Municipal Council, also designed agreement forms to gauge commitment to the project and persuaded each plot owner to sign his or her agreement to providing inputs for the completion of facilities. By the end of 1989, 85 plot owners had signed the forms, indicating their willingness to have the project implemented. By the close of the project, over 84 percent had complied with this agreement.

Finally, KWAHO involved key District Council staff from the departments of health and community services in designing, implementing, monitoring and evaluating the project, and in training and other interventions aimed at increasing the sustainability of project inputs. The Community Extension Officer assisted in the preparation of this case study by facilitating the use of participatory methods to involve community members in assessing the results and impact of the project on their lives. Annex 1 and 2 provide a description of the methods used and the results of these investigations.

Community Groups

Several community groups played an instrumental role in the project, and KWAHO played a key role in forming, strengthening and involving key groups in the project. Following is a description of these groups and the role they played in the project. The full list of community groups is attached as Annex 3.

The Village Health Committee (VHC)

This committee, formed in 1985 prior to the project, was identified as the first linkage between the project implementation team and the community. An important community organ, the committee had earlier assisted in the protection of a village spring with support from UNICEF. Some committee members had been trained and were involved in village health activities.

Once the project began, the VHC and several women's groups held strategy meetings where they agreed that an expanded VHC, comprising committee members drawn from different parts of the village including women's groups, would be formed. The committee would take part in:

- motivating and mobilizing the community to improve hygiene/sanitary practices;
- reporting malnourished cases to nutrition workers; and
- initiating dialogue with unresponsive community members to convince them of the importance of sanitation services.

Throughout the project, VHC also helped to assess the health status of the village and to work out ways of mobilizing villagers to sweep and collect refuse, clear clogged drains, and cut down overgrown bushes.

Kihato Women's Group

KWAHO identified women's groups, which comprise the bulk of Maina's community organizations (annex 2), as the main driving force if project activities were to be implemented in a sustainable way. KWAHO therefore convinced 12 women's groups to merge under one organization called "Kihato" (meaning "broom" in Kikuyu), which would represent them in matters related to village development. The group's functions were to mobilize villagers in village cleaning activities and assist members financially through income-generating activities.

The Kihato Women's Group also educated members on the importance of a clean environment. In addition, they constructed a Posho Mill as an income-generating activity aimed at improving the group's standard of living.

Mugi Self-Help Group

In May 1991, a group of community members who had attended a 2-week health seminar sponsored by UNICEF and attended by representatives from NMC and Ministry of Health formed the Mugi Self-Help Group to demonstrate what they had learned to the rest of the village. The group, which is composed of men and women; work with the Kihato Women's Group to carry out village cleaning projects; conduct home visits to educate villagers; and identify the sick, whom they take to hospital.

Landlords/Plot Owners

The landlords/plot owners were identified as an important community group as they are ultimately responsible for construction community inputs (materials and labor). This group, initially overlooked in project planning, was later identified by KWAHO as having critical input. On May 22, 1989, the landlords, NMC and the KWAHO community extension officer met on the proposed sewerage and sanitation component with the aim of generating ideas regarding project implementation and to determine the best course of action.

The plot owners criticized poor communication about the project, its objectives and the community's role in the project. They also felt threatened by the project because their 20-year leases had expired with no assurance of renewal. By clearing the misunderstanding between plot owners and the NMC, this meeting created interest and commitment to the project. In later meetings, landlords discussed the implementation agreement forms, which required them to pay a connection fee of Ksh 1,000 and to construct superstructures. During these meetings, the proposed changes were also discussed, and where necessary landlords agreed to give up part of their buildings to make room for the construction of the RSUs.

By the end of December 1990, out of 91 connections, 63 of the plot owners had entered into the agreement for constructing RSUs. The community had become convinced of the project's benefits and had developed a commitment to project objectives.

Village Leaders/Elders

In the course of project implementation, village elders and leaders actively participated in local meetings and decisionmaking on behalf of the Maina

community. Village leaders also represented the community in the District Development Committee as well as other meetings held by NMC or the NDO.

In August 1992, village elders formed a committee with the main objective of giving support to all other groups in Maina village so as to ensure that the benefits of the project were not wasted or misused. The village elders also joined other groups in cleaning sessions.

Study Tours

Early in the project KWAHO recognized the value of experience sharing in educating the community in its role and options for planning and designing project inputs. They organized several study tours for various groups of community members with the aim of allowing community members to see various examples of community involvement in similar projects. A exchange views with their counterparts in these communities.

Homa Bay

In a trip to Homa Bay organized in mid-1989, the study tour participants (two women's group leaders, five landlords, two tenants, a public health technician, Maina councillor, KWAHO community extension officer, assistant chief of Maina, municipal social welfare officer and sewerage attendant) visited project sites that were part of the same DANIDA-funded sewerage and sanitation project. At a community meeting after the tour, members said they were impressed by the designs of latrines and the maintenance systems in place. In addition, they confirmed that they wished to be connected to the sewer line despite the higher cost involved and requested the rapid completion of RSUs by the project implementors.

To disseminate the information to the rest of the community, the assistant chief organized a meeting that passed the following resolutions:

- construction of RSUs should start immediately;
- landlords would sign agreement forms to enable the work to begin;
- the study tour team should educate the rest of the community on the benefits of RSUs;
- the "scouting" plate seen in Homa Bay should be adopted; and
- water standpipes should be moved next to the superstructures of RSUs to prevent spill and sullage water from flooding the plots.

Health Tour

The Health Committee also made a study tour of Nyeri and Kirinyaga Districts, giving community members an opportunity to learn about water and energy conservation. A health education programme was thereafter planned and initiated twice a week for the children of Maina and Thama Primary Schools. Village meetings were followed by cleaning sessions involving members of community groups. Individual health education sessions were held for plot owners on how to clean their completed RSUs and the type of materials to use. All in all, the Health Committee acted as a pressure group that provided badly needed backup for the community in health, nutrition and sanitation.

Training

Another focus of KWAHO activities was community training, which aimed to improve the project's sustainability by increasing skills and knowledge and strengthening institutional arrangements for tackling water and sanitation problems. Per the agreement with DANIDA, KWAHO was to undertake educational campaigns on relevant issues to improve hygiene and sanitary practices, environmental health and the management, operation and maintenance of RSUs. Together with the community, they identified training needs and planned a training programme to focus on:

- health and sanitation
- refuse collection and disposal
- operation and maintenance, and
- health education material development in support of the sewerage project.

Because community leaders were seen as an important target group who would benefit from the planned training, a workshop for Maina village leaders was held in June 27-29, 1990 at Nyandarua County Council Hostel. The workshop's main objective was to discuss the sewerage project's operations and maintenance requirements; the provision and construction of RSUs; improvement of solid waste disposal; and the issue of improving water supply, toilet construction and usage. Both lectures and group discussions were used during training (Annex 5 outlines the training schedule for this workshop), and at the end of the workshop, recommendations for improving the project were made. These included construction of a public toilet at the bus stop, construction of toilet superstructures by landlords, encouraging proper excreta disposal practices ensuring proper refuse management, and educating other villagers on the project's objectives. Similar training was also provided to the VHC.

Health Education

To help KWAHO understand village health problems, data on Maina's health situation were collected. These were used to inform community members about diseases and social problems affecting the village. A list of common diseases by type and number affected is attached as Annex 7. As a result, the various committees intensified their task of informing the community about cleanliness in the village and persuading plot owners and tenants to participate in cleaning the village on a regular basis. Several community groups, such as the Mugi Self-Help Group, were also involved in visiting homes to identify the sick, offer advice and take the sick to treatment centers.

The implementation strategy for health education focused on problem-solving in which community members identified health problems, determined their causes and developed solutions. The KWAHO Extension Officer coordinated the campaign and assisted with planning, training and regular meetings with the community.

Health education was extended to school children of Maina and Thome schools, who received lectures in March 1990 on nutrition, immunization and diarrhoeal diseases with the goal of gradually changing their health-related behavior. A review carried out by KWAHO several years later reveals progress toward the adoption of improved health behavior as promoted by KWAHO and UNICEF. As a result of the introduction of new technology, additional training is necessary (e.g., to reduce sewer blockages from hard objects).

Building Sustainability

After the project came to an end in late 1992, it was expected that the community would continue to manage their facilities with some assistance from NMC. Institutional arrangements agreed between NMC and the village emphasized collaboration between government and community groups in the maintenance of some facilities (e.g., solid waste, sewers). NMC would ensure a regular supply of water to the village to ensure proper functioning of sewer sanitation facilities. On the other hand, the community would be expected to pay their water bills to avoid disconnection of this service. Proper use of solid waste receptacles, regular solid waste clean-up campaigns, and clearing of drains were also to be carried out by the community. The four staff members from the NMC Cleansing Department posted to Maina Village would ensure continued links between the Municipal Council and the community.

The KWAHO extension officer helped form an evaluation and monitoring committee to ensure that different community groups continue to play a role in sustaining activities begun under the project. It is, however, anticipated that all project-related infrastructure developments will be integrated into NMC's development plans so that upgrading and rehabilitation activities will take into account this infrastructure.

In terms of physical inputs, contractors and artisans based in Nyahururu, who were involved in the project have learned skills that can be used in other similar projects, and Nyahururu residents will be able to hire them on a private basis to improve or maintain sanitation facilities.

Throughout the project, KWAHO was able to mobilize community support (money and labor), to manage and maintain the facilities. Using a phased approach, KWAHO was also able to pave the way for other works in the community. While construction was under way in Area I, KWAHO was soliciting community consent and views about Area II, where signing of the agreement forms became easier because the benefits of past work were easily seen. By June 1993, 83 out of 98 RSUs were installed in Area I, and 90 out of 97 installed in Area II. KWAHO also played a significant role in getting the project extended to Area III and by June 1993, 84 out of 97 VIP latrines had been completed.

In conclusion, community mobilization, although not initially planned, played an important role in ensuring the successful implementation of the project. Although it is not certain, the experience of this project indicates that had community mobilization been introduced earlier in the project, more effective community participation in project planning and implementation may have resulted and delays experienced during the early part of Phase II would have been averted.

A summary of community mobilization and training activities carried out in Maina Village is attached as annex 4.

One aspect of sustainability that was not thoroughly examined either during the project or in this case study is the economic aspects of the component in terms of the real cost of the inputs, level of subsidy provided by the project, and affordability of services provided in the long term. The total cost of constructing one RSU toilet using quarry stone was approximately Kshs 25,000, while a VIP latrine cost about Kshs 50,000, the additional cost being attributed to the sub-structure. With regard to both RSUs and VIPs, maintenance costs have not been considered. For RSUs costs of water and sewerage services must be paid in order for the facilities to continue functioning, while VIPS will require periodic emptying. Further study of these issues would provide a more accurate picture of long term sustainability of inputs provided under the project.

PHYSICAL ACHIEVEMENTS

The following section describes the project's physical achievements, including roads and storm drains, residential sanitation units, communal refuse tips, and latrines.

Residential Sanitation Units (RSUs) and Ventilation Improved Pit Latrines (VIPLS)

The connection of toilets (RSUs) to the sewer was the initial aim of the project. With input from the community, study tours, and public health departments, a design for the RSU which included a toilet, wash room and accompanying wash slab was agreed for Areas I and II. In early discussions with the community, landlords welcomed the idea of RSUs, since they would eliminate the need for replacing full or collapsed latrines. The tenants felt it was worth paying a little more to have a flush toilet than to have latrines filled and overflowing.

Each plot was expected to have one or two RSUs, depending on the number of occupants. In Area III, which was unsewered, one VIP was provided for plots with up to 15 people and two for plots with more than 15. Due to the poor soil and high water table the pit latrines, which measure 2 meters in diameter by 3 meters deep, are cylindrical in shape with a reinforced foundation lining of masonry stones and a reinforced slab with two compartments. The wall lining consists of three courses: a) six courses with closed joints; b) six courses with open vertical joints; and c) two top courses with closed joints. The open vertical joints have two important functions: to facilitate seepage into surrounding areas and to allow water into the pit latrine, which helps to dilute faecal matter and ensure its biological stabilization.

The project constructed RSUs and latrines up to the base level after which the tenants or plot owners were free to use other materials to complete the superstructures. Various demonstration latrines were constructed to illustrate options and completed super structures therefore range from semi-permanent to permanent.

In Areas I and II construction of the base structures and most super structures had been completed. In Area III, work on the sub-structures had been completed just before to the end of the project. It is not known if construction of superstructures has been completed. Table I. below shows the number of RSUs constructed in the village by the end of the project.

Table I.
RSUs Constructed in Maina Village by the end of the Project

| Area | Base Structure Complete/Planned | Superstructure Complete | Superstructure Incomplete |
|-----------------------|---------------------------------|-------------------------|---------------------------|
| Area I | 98 | 83 | 15 |
| Area II | 97 | 90 | 7 |
| Area III | 97 | 84 | 13 |
| Maina Primary School | 32 | - | - |
| Thama Primary School | 28 | - | - |
| Public Toilets | 4 | 4 | 0 |
| Demonstration Toilets | 4 | 4 | 0 |

Source: Field Work, 1992.

Communal and Static Refuse Tips

Thirty refuse tips constructed in the village are strategically located at the community's former dumping sites. The location of the tips was identified by a survey carried out by the KWAHO extension officer and the DANIDA assistant engineer. According to the original plan, the tips would have steel gates, but due to vandalism, stone walling measuring 0.7 meters high with open joints at the lower course was constructed.

NMC is responsible for collecting the garbage from the garbage tips, and community members have agreed to pay a collection fee if it is fairly charged. In a meeting of 160 plot owners on January 26, 1990, plot owners agreed to give maximum cooperation and assistance to the project implementors, including provision of materials and sites for construction. This support was provided, and on completion of construction, community cleaning teams continued to conduct a clean-up exercise every Tuesday.

Improved Roads and Storm Drains

An added feature of the project was a road improvement and storm drainage component, which was coordinated with the laying of sewer lines, forming the basic infrastructure that was needed before sanitation improvements could be made.

The village road network and drainage system was expanded and upgraded, several roads were added, realigned or graded, and bumps and sanitary lanes were introduced. To alleviate poor drainage, storm drains were constructed alongside the roads.

A major contribution to the success of this component and the entire project was plot owners' consent to give up part of their land for the construction of community infrastructure.

The Afforestation Programme

An afforestation programme was incorporated into the project in August 1992 in an attempt to create a buffer zone between the village and the Gathare stream which supplies drinking water to Nyahururu. Wastewater would filter through the buffer before entering the stream. This measure was taken to control or reduce pollution of the stream. Twelve hectares were set aside for the programme and by September 1992, eight hectares had been planted with seedlings of Eucalyptus³ trees by community adults and school children. In some cases, however, the villagers uprooted the seedlings, fearing they may lose their shambas. In other cases, the seedlings died as a result of neglect. More time may have been required to educate the community on the importance of the afforestation programme. But as this programme was only initiated at the tail end of the project this was not done.

Component Costs

Finding the proper mix of hardware (appropriate technology) and software (human resource and institutional development) is a complex part of project planning. DANIDA recognized this fact during the initial stages of implementation, when the community reacted negatively to the project due to lack of information about project goals and the lack of community involvement in project planning. Although the component was designed as a hardware component, software eventually became a key element.

The table below shows the breakdown of costs for both hardware and software. The table shows that, a relatively small capital outlay was earmarked for software, the impact of the software. Despite this, the software element contributed significantly to the successful implementation of the Maina Village Sewerage and Sanitation Component.

| | |
|--|--------------------------|
| • OVERALL PROJECT | 851.1 Ksh Million |
| • MAINA VILLAGE - SEWERAGE & SANITATION COMPONENT | 18.0 Ksh Million |

³Eucalyptus trees, with their high evapo-transpiration rate, can help reduce water logged conditions, allowing the soil to act as a filter.

| COST SUMMARY | | Kshs (millions) |
|-----------------------------|-------|--------------------------|
| A. HARDWARE | | |
| Area I | | |
| RSUs and Sewers | | 2.0 |
| Area II | | |
| Roads | | 3.5 |
| Surface Drains | | 1.0 |
| RSUs and Sewers | | 3.5 |
| Area III | | |
| Pit Latrines | | 3.9 |
| Collection Tips | | 0.8 |
| Miscellaneous | | 0.5 |
| Drains and Afforestation | | 0.3 |
| | ----- | |
| Sub-total | | 15.5 |
| B. SOFTWARE | | |
| KWAHO (estimated) | | 1.0 |
| Carl Bro Kenya | | 1.5 |
| | ----- | |
| | | 2.5 |
| | ==== | |
| Total Cost | | 18.0 Million Kshs |

Chapter VI.

POST-PROJECT DEVELOPMENTS IN MAINA VILLAGE

This section outlines new development that took place in Maina Village after this case study had been completed and the project was coming to a close. It describes efforts made by DANIDA and KWAHO to reconcile these developments with inputs provided through the project.

Land tenure forms the basis of development policy, performing both an indirect, facilitating role and a direct, active one. The optimal system of land tenure is one that achieves tenure arrangements capable of reconciling the tensions between the public and the private nature of land. Most communities view land tenure as more than a mere relationship between people and land: land ownership is the foundation of cultural, social and political concern. Indeed, evolution of government is closely linked to the struggle over land, and present patterns of land tenure everywhere cannot be properly understood without examining how they evolved.

The original inhabitants of Maina village had been given a 20-year lease on land, which expired in 1985. The uncertainty of future land tenure not only affected the village's development but greatly affected the initiation of the sewerage and sanitation project because the community felt that, without legal title to the land, developments in the village could lead to their displacement. After a series of consultative meetings in 1989, the project implementors -- DANIDA and the client NMC -- entered into an agreement on a physical plan to be adopted in project implementation. The agreed physical plan made minimal changes to the existing layout of the village and was accepted by all parties.

Following a presidential directive in March 1992, 99 year leases were granted to residents of Maina Village. To facilitate the implementation of this directive, and to comply with national building codes and standards, a new physical plan for Maina Village was prepared by NMC. The new plan proposed increasing the plot size in Maina from 30 x 80 to 50 x 100 ft. It also reflected an extension of the village to incorporate about 200 plots in the swampy area bordering the stream.

If implemented as initially drawn up, the new physical plan, which is an extension of the plan initially rejected by DANIDA, would have resulted in mass displacement of Maina's current residents and the demolition of most of the existing structures. On the basis of the new physical plan, plot allotment letters were issued to most plot owners in Areas I, II and III in July 1992, and some plots in the new area (hereafter referred to as Area IV) were to be given to current tenants in Maina.

DANIDA first found out about the new plan during a field visit to Maina in August 1992. The visiting team which had arranged to coincide with the launching of this case study, was informed of the council's intentions to extend village boundaries to the area bordering Gathare stream. Concern was voiced

about the possible effects of the new plan on the infrastructure developed under the project and, after much discussion, it was agreed that a meeting be held to discuss the implications of the new developments. During subsequent meetings with the municipal and district councils, it was confirmed that efforts were under way to address several oversights made in the design of the new physical plan for the village and in its implementation. The following were issues raised by the new developments were discussed.

1. The new physical plan could result in displacement of residents because the proposed increase in plot sizes and additional infrastructure (roads, council offices) would require the relocation of many houses. In discussions, the council assured DANIDA that every effort was being made to reduce the displacement and shifting of current Maina residents.
2. Special conditions provided to plot owners with allotment letters were not modified to suit conditions in Maina: The conditions were the standard issue for development in a medium- or low-density area such as Nairobi (Annex 6). In discussions with the council, it was noted that the villagers would only be required to build a permanent foundation. Timber walls and corrugated iron sheet roofing, such as those currently used in Maina, would be acceptable building materials for the new area to be developed. Adequate time would be given to meet the conditions.
3. A concern that health benefits would be lost if further development took place below the sewer line, was also raised. The council indicated that the intention was to maintain and even enhance the benefits gained from the DANIDA-funded project, though further discussion indicated very little could be done to ensure this. It is difficult to construct adequate sanitation facilities in this area, which as it has a high water table and water logged condition due to the black cotton soil.
4. The effect of these developments on the municipal water supply was also discussed since the new plan indicates that plots would be allocated in the area between the village and the Gathare stream. The stream feeds into the municipal water supply intake, so water pollution could become a problem if additional latrines were built in this area.

Maina's landlords and tenants regarded the new physical plan with a lot of suspicion. The threat of displacement had been renewed, and residents were concerned that they might lose their investments if plots were realigned. Although the project was coming to a close, it was agreed that dialogue between DANIDA, the project team, the municipality and the community should continue until agreement on a suitable arrangement was reached.

A new physical plan reflecting Maina's current situation would therefore be prepared on the basis of the findings of a team of surveyors and this plan will form the basis for decisions regarding the scope and nature of changes to the existing village and necessary requirements for its proposed expansion.

Finally, it was proposed that KWAHO remain in Maina during the transition period to ensure that the community is informed about proposed changes and continue to carry out the improvements, maintenance and management of facilities that had been initiated by the project.

At the time of publication, a second survey was underway to amend certain aspects of the physical plan that had not been properly surveyed. The NMC indicated that very few changes would occur and these alignments would provide for community infrastructure such as roads. There is still some concern about the development of the area bordering the stream, however the council has stipulated that no construction will be allowed in this area without a septic tank or cess pool.

Chapter VI.

LESSONS LEARNED

- * **Risks associated with land tenure should be well understood and accounted for in project planning.**

Land tenure profoundly affects the success of an upgrading project because it clarifies the duties, rights and obligations of all the actors in a project from the very beginning. To the land owner, it is the guarantee that the land belongs to him or her to use in the most efficient way possible, both in short and long term. The local authority gives legal entitlement to the land and infrastructure.

In any project involving the installation of physical infrastructure, the permanency of such infrastructure should be "guaranteed" against unnecessary alterations. This guarantee can be forthcoming only if there is a well defined land tenure system and a mutually agreed and legally binding physical plan. In the Maina experience, DANIDA and the NMC entered into an agreement that no alterations were going to take place in Maina's physical plan after DANIDA had invested in the infrastructure. The agreement was made with the understanding that inhabitants would in the future get title to the plots they occupied. In the previous chapter it is clear that the new physical plan drawn up at the end of project implementation phase threatened to change the original pattern of plot "ownership" and to destroy some of the infrastructure laid down by the project. However, despite efforts made early in the project to resolve the tenure situation, these were not sufficient to prevent changes in the long term.

A key lesson of the project is that poor communities participate more meaningfully in projects that they identify as their own. Title to land which gives a sense of security and permanency is important in ensuring that communities have no reservations in mobilizing their resources to support a project. With secure land tenure, communities also have a long-term interest in their environment and are more likely to ensure that a project's benefits are sustained.

By ensuring that land tenure is well understood before project implementation, donors help lower the risk that their investment may be lost through changes in the tenure system after project completion. Project activities should therefore be coordinated with governments' long-term development plans.

- * **An integrated approach to project planning will give better results and ensure sustainability.**

The project benefitted from the integration of activities on various levels. On one level, the success achieved in this project can be attributed to the links between various institutions (the community to the municipality and to the funding agency). The concerted effort of all the concerned parties: government ministries, local authorities, the community, donor community and the NGOs, and constant consultation through a joint steering committee was intended to ensure that a comprehensive approach toward the project would be taken. It was not until

formation of the site committee that full community participation was introduced into the project, as there was no effective community representation at the steering committee level. The village chief played the dual role of representing both the community and the civil service and KWAHO, which was represented on both committees, served as the common link between them.

Intersectoral integration was a key element of the project because of the multisectoral nature of health and sanitation issues. The overriding objective of the project -- to improve the health of Maina's residents -- led to the eventual integration of various other elements into the project, including the sewer system, roads, storm water drains, toilets/latrines, bathing facilities and the afforestation program. The regular inter-sectoral meetings among the various parties in the Maina village project served as a forum for integrating activities across sectors while maintaining linkages between the various components.

- * **Raising a community's awareness and incorporating its views, ideas and knowledge in project design significantly increased commitment, ownership and sustainability.**

At every stage in a project's cycle, from initiation to implementation, the information flow between all the actors is important. These channels of information have three major functions: to identify and create awareness of the community needs, to create awareness and to ensure sustainability. Communities have many formal and informal structures through which mobilization is possible including women's groups, self-help groups, youth groups and village elders. These structures act as important channels for the exchange of ideas, sharing of views and knowledge. In Maina village there are about 14 women and self-help groups, which KWAHO used as entry points to community mobilization and training. Local decisionmaking structures must be understood and community leaders involved in decisionmaking about community-based projects.

Whether rich or poor, communities can reject completed and well meant projects simply because they have not been consulted. The initial resistance and disapproval of Maina's residents to the demonstration latrines is a case in point because the community was not involved or informed at the beginning of the DANIDA-funded project and was therefore suspicious of the project.

Conversely, communities are willing to contribute their limited resources to support a project they have identified as their own. Plot owners in Maina were willing to give up some space for the construction of RSUs' or, when space was not instantly available, plot owners were willing to demolish at least one room to create space for RSUs. A high rate of completion of superstructures (over 80 percent) once the community had accepted the project also illustrates the role that community involvement can play in making a project successful.

Communities should also take an active part in selecting and adapting technology so that their socio-economic and cultural needs are taken into account. The introduction of any new technology should be based on information about a community's present knowledge, attitudes and practices. Further, exposure to new ideas through field visits and study tours can also help to broaden the options from which a community can choose.

As mentioned earlier, community members made a study tour to several Kenyan towns to examine problems and alternative solutions. During the study visit to Homa Bay, the community saw various toilet designs, such as pour flush latrines, which were different from the demonstration in Maina village. The community preferred the type they saw in Homa Bay and requested that they be constructed in Maina village.

DANIDA, the project team and steering committee were flexible and accepted the change in design to accommodate the community's choice of technology. The community had already learnt some tips on the operation and maintenance of such facilities and were convinced that this technology was appropriate and suitable for Maina.

Although the community indicated willingness to pay for the technologies that they chose and to pay the higher cost, by the end of the project it was noted that despite a high number of defaulters, NMC was not keen to disconnect water and was not charging fully for the sewage service.

*** Training and health education are important elements of sanitation projects.**

Training in operation, maintenance and overall project management is an important component of any community-based project. However, an adequate understanding of community knowledge, attitudes and socio-cultural values must be acquired before a suitable programme can be designed. If training is conducted as a continuous process involving both the community and all other parties, it can ensure sustainability and effective use of facilities. Well developed training programs can create awareness of the broader aspects of health and sanitation. Training of illiterate, older village men and women in operating and maintaining facilities is possible. Training is more effective when it is practical and stresses the needs of the community.

During the project, several community groups attended workshops and seminars where they received training on relevant issues such as hygiene and improved sanitary practices. The trained groups thereafter shared their experience with the community in practical ways. For instance, the Mugi Self-Help Group is using the skills learned from seminars and workshops in the village by visiting households and teaching residents the best way to maintain a healthy and clean environment. It was noted that health education was much better received when conducted by community leaders and elders than by outsiders.

KWAHO's main task in the project was to coordinate physical development and community organization in order to enhance active participation. Through training, the community was able to participate actively in all stages of project planning and implementation.

- * **Implementation arrangements made by Donors and project managers should be adaptive and flexible to enable rapid response to problems that arise during project implementation.**

Implementation arrangements should be well defined in project planning but flexible enough to make adjustments when need be. In the Maina village project DANIDA has been flexible and willing to make adjustments to the project in order to ensure its success.

Though the community mobilization component was not originally included in the Maina project, when this was identified as a need, KWAHO was engaged to assist with community mobilization. As noted in previous sections, this role was important in gaining community commitment to the project.

DANIDA has not only been flexible in engaging other institutions to undertake specified tasks, but it has also made adjustments in the hardware component to suit the communities priorities. DANIDA agreed to include a component for constructing VIP latrines in Area III to meet the sanitation requirements of the remaining residents of the village. This was recognized as important during a review mission, which noted that the health benefits of the project's inputs in Area I and II would be lost if sanitation improvements were not made in the low-lying area of the village. Finally, an afforestation programme was also included as a solution to the pollution of the Gathare stream.

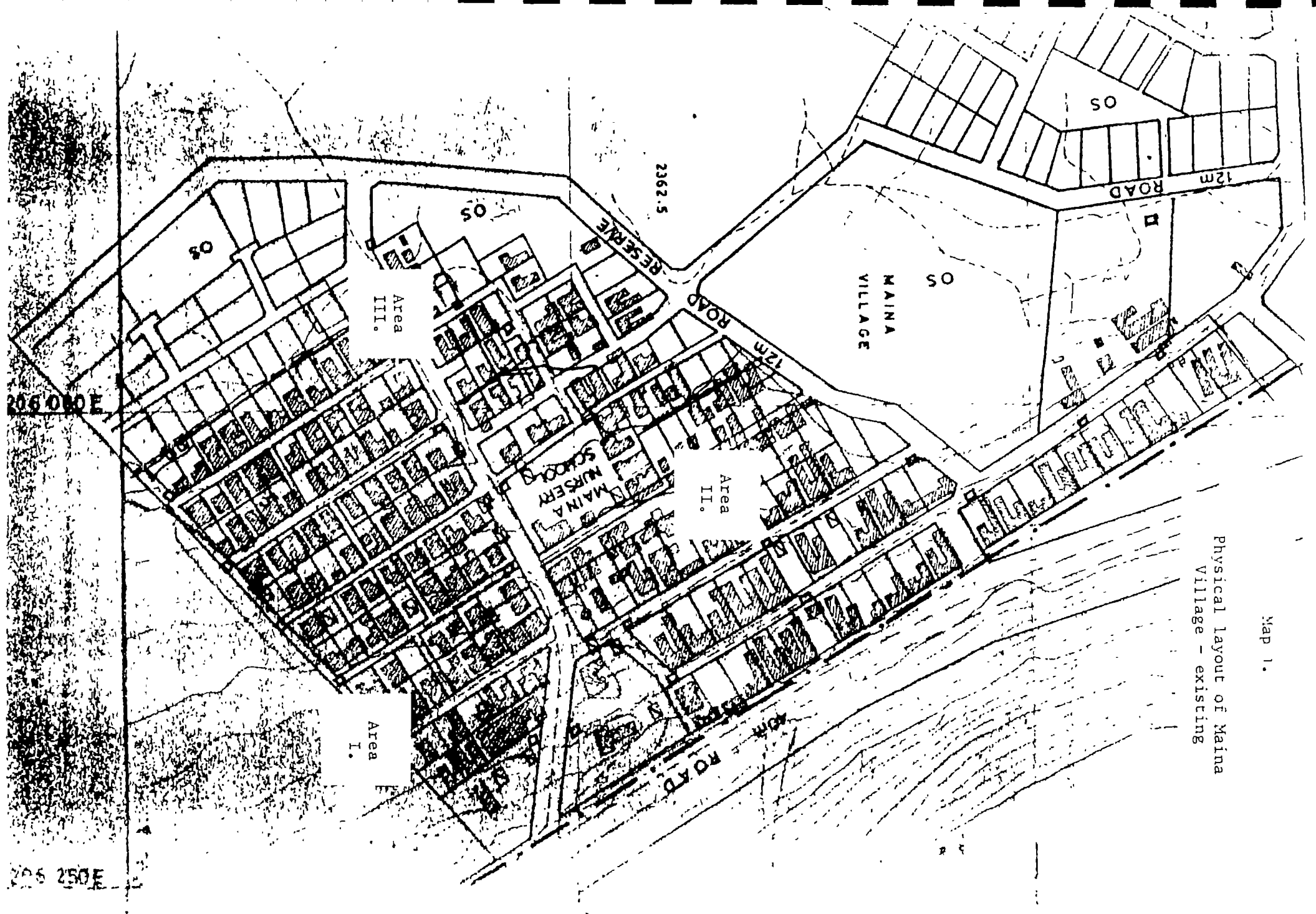
DANIDA's regular project reviews served as a system for monitoring and evaluating the status fo the project. All the adaptations made to the project came as recommendations of project review teams tasked to regularly monitor, evaluate and adjust the project so that it would meet its goals.

Recommendations for Follow-up Action

Community-based projects should be self-sustaining. They should not be limited by external time and resource constraints as communities can often contribute additional resources over an extended period of time after the donor sources have been exhausted. Communities should therefore be allowed to participate voluntarily and at their own pace, upgrading facilities when they are able to afford better materials. When artificial deadlines are imposed on communities, the project is bound to fail in some way. Projects whose pace and direction are determined by the beneficiaries have a higher survival rate.

1. In order to ensure sustained use of the services in Maina, it was recommended that KWAHO be given an extension period of about 6 to 12 months within which the community can take over full responsibility for the project. KWAHO's extension officer would continue the process of strengthening the community organizations to build sustainability and ensure effective use of the infrastructure. An extension of several months was provided, but this was disrupted by the new developments described in chapter 6.

2. Training in operation and maintenance, an important part of sanitation projects, has not yet been provided. The community still needs information about which materials should be used in the toilets to avoid sewer blockages, and to allow for proper management of their facilities.
3. Income-generating projects are vital in enhancing a community's socio-economic status. The posho mill given by DANIDA to the Kihato women's group was inadequate for all the women's groups in Maina and, since it only provided direct income to a small group of women, was not acceptable to other community groups. If funds were available to establish a revolving fund, other self-help groups in the village would have a chance to establish viable income-generating projects.
4. Since there is a high rate of water disconnection in Maina, there is a need to rehabilitate the spring, which has been poorly managed. All the taps removed. By undertaking rehabilitation of the spring, a potential donor will ensure year round availability of water in all the homesteads.
5. Maina's dispensary provides services to 14,000 village residents as well as outsiders, but staff and facilities are inadequate to serve such a large population. The immunization room, for example, needs to be expanded if it is to meet the needs of the people.
6. The drains in Area III, which have not been lined, are bound to collapse and fill in because of Maina's nonporous black cotton soil. If cleaning is not performed regularly, there can also be adverse health related effects, so it would be advisable to line these drains. In Thama Primary School, the drainage system is poor. During the rains, classrooms are flooded, and the children have to endure wet conditions throughout the day in their bare feet. Trench drains should be constructed along the classrooms.
7. Continued support to the NMC, during the development of the area adjacent to the Gathare stream may also help to ensure that the benefits derived from the project are not lost.



206 080 E

206 250 E

Area I.

Area III.

Area II.

MAINA NURSERY SCHOOL

MAINA VILLAGE

RESERVE ROAD

ROAD 12M

ROAD 12M

ROAD 40M

Physical layout of Maina Village - existing

Map 1.

Map 2.
New Physical Plan of Maina
Village - proposed



AND FUTURE
SPECIAL PURPOSE

MAINA PRIMARY SCHOOL

2,

ROAD RESERVE

BAPTIST CHURCH

NURSERY SCHOOL

CATHOLIC CHURCH

PUBLIC PLANNED
OPEN SPACE

SOCIAL HALL AND
COMMUNITY CENTRE

OPEN AIR
MARKET

ADMINISTRATION AND
A.P. LINES

PROPOSED CHURCH

2,

PRIMARY SCHOOL

PROPOSED
SPECIAL PURPOSE

PROPOSED
PUBLIC PURPOSE

2,

MURRUMBO SECONDARY SCHOOL

**Methods Used to Gather Information for the
Case Study in Maina Village, Nyahururu
18th - 23rd August, 1992**

1. Introduction, Methods and Goals

Participatory methods are constantly being applied during the study of community-based activities because participatory methods allow the beneficiaries to express themselves confidently without fear. The participatory approach enables learners to take greater control of their lives and environment and gives them a chance to develop skills in problem solving. This approach, which gave the community members a chance to analyze and solve problems in groups, was applied to the case study on Maina village.

The data collection for the case study was done in two parts: the first involved discussions and briefing in Nairobi with DANIDA, KWAHO and Regional Water and Sanitation Group-East Africa (RWSG-EA) representatives; the second involved discussions in the field with NMC officials, Nyandarua District officials and community members.

The following methodologies were applied:

2. WALK - ABOUT AND SITE VISITS

A walk-about was conducted around the village in order to get an understanding of the physical layout.

At the end of the walk, the team consisting of officials from DANIDA, RWSG-EA, KWAHO and the consultants were invited by Kihato women's group to the posho mill for introductory speeches and discussions. The introductions created a sense of trust and understanding between the visitors and community. The community groups and the consultants prepared a tentative program for the week.

3. SARAR Methodology

The SARAR methodology integrates five elements which include, "self esteem", "associative strengths", "resourcefulness", "action planning", and "responsibility". In this case study, the SARAR methodology was used so as to generate discussion with the community members and to involve them in identifying problems and finding solutions. Several methods were used including:

- 3.1 **Health/Hygiene Three-Pile Sorting Cards:** The three-pile sorting cards were used with members of the VHC site committee, and Kihato and Mugi self-help groups. The main purpose was to assess health/hygiene

awareness and to reflect on the causes and effects of their problems. A set of 15 drawings concerning water, health and sanitation related situations and behavior common in Maina village were given to participants, who were divided into two groups. The task for each group was to arrange the pictures according to "good", "bad" and "intermediate". Each group was given 20 minutes to discuss and sort the cards before presenting their findings.

During the presentations, it was observed that the community members had good health awareness. Suggestions on how to improve bad hygiene and sanitation situations were discussed during the plenary. Two main recommendations were:

- Training materials should be developed by school children so as to create awareness in the children about common diseases in the village.
- A recruitment drive should be intensified so that more members would join the existing community groups during cleaning sessions.

In conclusion this method allowed the community to identify their health status and draw up a plan of action for improving it.

3.2 Map Comparison

The map comparison exercise was done with members of the site committee. The main purpose was to assess to what extent community members had completed the construction of superstructures for the RSUs, and to give the community a chance to discuss the new physical plan. The site committee members brought along their letters of allotment, which had a map of the village and special conditions attached. The main task was to find one's plot on the new plan and check if there had been misallocation or not. Each member was given ten minutes to study the map and identify his/her plot on the map. The findings were discussed openly with the rest of the community members, and it was recommended that a meeting be organized between NMC and the community members to discuss the new physical plan. In conclusion this method helped the community (members) to gain a better understanding of the implications of the new physical plan for each member.

3.3 Task/Resource Analysis

The Kihato Women's Group was involved in an activity to analyze community and domestic roles and responsibilities according to gender considerations. The main purpose of the task/resource analysis was to find out from the women which roles they play in relation to water and sanitation and what resources are available to support their efforts. The first set of drawings encouraged the participants to discuss the issue of ownership and control of

property within a typical household in Maina village, the household and community. Pictures of common items like a bicycle, hoe, plough and oxen, etc. were given to each person. Discussions were centered around issues of ownership, usage and control, as well as gender roles and responsibilities. In conclusion, it was found that most manufactured goods, such as radios and bicycles, were owned by men, while women owned handicrafts such as baskets and implements for use in their domestic chores. It was agreed that children belonged to both men and women.

The second task involved the use of pictures representing typical household or community activities, or tasks. The ensuing discussions were centered around the roles of men versus women. Each participant was given a drawing and requested to study it with the aim of making a short presentation on her interpretation of the picture. The participants were able to relate what they saw in the picture to the real situation in the village. In this activity, it turned out that most household and community tasks were performed by women. In conclusion, the group agreed that in order to improve the sanitation situation of the village, both men and women must work together.

4.0. Other Methods Used

4.0.1 Interviews

Interviews were carried out with a cross section of those who had been involved in project implementation. The agencies interviewed included KWAHO, NMC, DANIDA, Government officials and community leaders. This methodology enabled the interviewers to gather information about past activities and events. During the interviews, the interviewees narrated their experiences including historical aspects, progress and problems encountered. A simple questionnaire was developed by the consultants (a copy is attached) and used in community level interviews.

5.0 PARTICIPANT OBSERVATION

Participant observation requires active observation of the subject under review. In the case of Maina village, the method was applied in order to understand the normal life of the village. It was done in two ways:

5.2 Street Observation

This involved entering houses, latrines and toilets and observing how water was collected and used. By being closer to community members on a more regular basis, the interviewer was able to better understand the composition and nature of the village and how the community members lived on a day-to-day basis.

6. Participation in the Pub

The study team visited the local pub in the village in the company of the extension officer. The visit was aimed at assessing how the adults in the

community felt about their daily problems and what kind of recreational activities they are engaged in. The discussions in the local pub were very useful as they enabled the study team to assess what the communities thought about the community extension officer. They referred to him affectionately as "doctor" due to his role of keeping the village clean. Problems associated with land tenure were lamented by the entire cross section of villagers.

6.0 CONCLUSION

By using a combination of participatory and other research techniques, we were able to learn more about the activities of Maina village. The community members demonstrated the knowledge they had of health-related situations, and women were able to recognize the role they played in the development of the village. Moreover, the direct involvement of the community in the evaluation process brought immediate results in terms of a heightened awareness of their situation and a collective commitment to initiate improvements.

**Questionnaire Used in Data Collection
Maina Village, Nyahururu**

1. **KWAHO**
 - What led to KWAHO's involvement in Maina village?
 - What strategies were employed while working with the communities?
 - Have you developed any training materials?
 - What kind of problems have you faced while working with communities?

2. **Nyahururu Municipal Council (NMC)**
 - Why have you developed two plans?
 - Why did you find it necessary to introduce Area IV?
 - Is the Council capable of developing Area IV?
 - Why has the Council not collected the sewerage connection fee?
 - How often does the Council collect garbage from the village?
 - How often does the village go without water?
 - Are there any water defaulters from Maina village?

3. **Physical Planning Officer**
 - What is the difference between the first plan and the second plan?
 - The new plan would displace and relocate some plot owners. How would you handle the victims?
 - Are you aware that Area IV is not habitable?

4. **Community Leaders**
 - Self introduction of the leaders
 - When was the group formed?
 - What activities is the group involved in?
 - What are the group procedures?
 - Has your group received any training?
 - What problems have you faced as a group?

5. **Community Members**
 - What are the common diseases in the village?
 - What are the cultural beliefs associated with defecation?
 - Does the water supply work efficiently?
 - What kind of businesses are operated within the village?
 - Have house rents gone up since the introduction of the project?
 - Do landlords live in Maina village or outside?

6. **Various Community Groups**
Health Committee
 - Is there a health facility within the village?
 - Do people use it?

- What activities does your committee engage in?
- How do you involve other community members in sanitation activities?

Kihato Women's Group

- How was the group formed?
- What are the objectives of the group?
- What kind of activities is the group engaged in?
- Have you been trained in the management of the group activities?
- What problems are facing the group?

Site Committee

- What role did you play during construction?
- What problems did you encounter?
- What is your role now?

Mugi Self-Help Group

- When did you start the group?
- What are the objectives of the group?
- What activities does the group undertake?
- What are the achievements of the group?
- How does the group view its role in relation to the changing situation of the village?

Community Groups in Maina Village

Maendeleo ya Wanawake

Catholic Women's Group

Ngunyu Mutethia Women's Group

Maina Kwikota Women's Group

Child Welfare Women's Group

Gospel of God Women's Group

Baptist Women's Group

Maina Gwitheria Women's Group

Mwiteithia Women's Group

Mwireri Women's Group

P.C.E.A Women's Group

Muongano Women's Group

Village Health Committee

Mugi Self-Help Group

Jam Ghetto Youth Group

Summary of Community Mobilization and Training Activities Related to Maina Village

| TYPE OF ACTIVITY | # | OBJECTIVE | EXPECTED RESULTS |
|--|----------|--|--|
| 1. Extension Worker Meets With Community | 12 | <ul style="list-style-type: none"> - Discuss community problems - Explain the objectives of the project | <ul style="list-style-type: none"> - Creation of awareness - Acceptance of the project |
| 2. Site Committee Meeting | 6 | <ul style="list-style-type: none"> - Harmonising conflicts - Link between beneficiary/implementors - Monitoring project implementation - Legal agreement signed - Implementation enhanced | <ul style="list-style-type: none"> - Changes to project implementation plan as per community recommendations |
| 3. Landlords Meeting | 5 | <ul style="list-style-type: none"> - Explain Project objectives - Iron out misunderstanding between the Council and landlords - Solicit participation | <ul style="list-style-type: none"> - Contribution of resources - Demolitions of parts of plots - Put up superstructures |
| 4. Steering Committee Meeting | 4 | <ul style="list-style-type: none"> - Policy guidelines - Consider decisions of Site Committee | <ul style="list-style-type: none"> - Agree on a physical plan - Incorporate communities views |
| 5. Health Committee Meeting | 10 | <ul style="list-style-type: none"> - Discuss health status of the village - Clean the village | <ul style="list-style-type: none"> - Roster drawn for cleaning - Villagers mobilized to clean the village |
| 6. Kihato Meeting | 4 | <ul style="list-style-type: none"> - Map our strategies for cleaning - Discuss management of their project - Contribute ideas re: health status | <ul style="list-style-type: none"> - Running of the posho mill - Cleaning the Village |

| | | | |
|---|----|---|---|
| 7. Kihato Health Meetings - Joint Committee | 4 | - Discuss cleaning programme - Meet with outside visitors | - Intensified cleaning - Improved environment |
| 8. Cleaning sessions | 10 | - Improve health and sanitation of the village | - Clean environment - Healthy Community |
| 9. Study hours + Workshops | 3 | - Learn from the other projects - Acquire skills | - Adopt new designs - Change attitudes |
| 10. Community Training | 1 | - Leaders discuss the project - Training on role of community in project | - Discuss solid waste management - Improvement in solid waste management. - Participation in project |
| 11. Home Visits- | | - See whether villagers were practicing what they had learnt - Discuss face to face | - Latrine construction progressed well - Use of garbage dumps |
| 12. Public Baraza (Meeting) | 3 | - Mayor issues certificates to committees - Introduce Project Engineer - Inform about Homa Bay trip | - Reach the whole community - Give information that concerns the whole village |
| 13. Income-Generating Sessions | 3 | - Raise funds for the groups | - DANIDA donation of posho mill - MOH, pilot demonstration - Community raising funds - Mugi Self-Help Group |
| 14. Interaction with visitors from outside | 4 | - To see what changes had taken place in the village | - Pay attention to the problems facing the village - Appreciate villagers' efforts in cleaning the village |
| 15. Meeting with Municipal Authorities | 2 | - How to extend services to the village | - Regular garbage collection - Posting of staff to the village - Improved water supply |

Training Schedule

| Time | Wednesday 27-5-90 | Thursday 28-5-90 | Friday 29-5-90 |
|-------|---|-------------------------------------|----------------------------------|
| 8.30 | Project and its objectives | Communicable Diseases | Nutrition Childcare |
| 10.30 | | TEA BREAK | |
| 11.00 | Residential sanitary units and sewerage | Solid waste management | Storm water draining maintenance |
| 1.00 | | LUNCH BREAK | |
| 2.00 | Sewerage operating maintenance | Personal hygiene Family planning | Closing |

Special Conditions

1. No building shall be erected on the land nor shall additions of external alterations be made to any buildings otherwise than in conformity with plans and specifications previously approved in writing by the Commissioner of Lands. The Commissioner shall not give his approval unless he is advised that the proposals are such as to develop the land adequately and satisfactorily.
2. The Lessee shall within six calendar months of the actual registration of the lease submit in triplicate to the Local Authority and the Commissioner of Lands plans (including block plans showing the positions of the buildings and a system of drainage for the disposal of sewerage surface and sullage water) drawing elevations and specifications of the buildings the lessee purposes to erect on the land and shall within 4 months of the actual registration of the lease complete the erection of such buildings and the construction of the drainage system in conformity with such plans, drawings, elevations and specifications as amended (if such be the case) by the Commissioner PROVIDED that notwithstanding anything to contrary contained in or implied by Government Lands Act (cap 280). If default shall be made in the performance or observance of any of the requirements of this condition it shall be lawful for the Commissioner of Lands or any person authorized by him on behalf thereof in the name of the whole and thereupon the term hereby created shall cease but without prejudice to any right of action or remedy of the President or the Commissioner in respect of any antecedent breach or any condition herein contained.
3. The Lessee shall maintain in good and substantial repair and conditions all buildings at any time erected on the land.
4. Should the lessee give notice in writing to the Commissioner of Lands that he is unable to complete the building within the period aforesaid the Commissioner of Lands shall (at the lessee's expense) accept a surrender of land comprised herein PROVIDED FURTHER that if such notice as aforesaid shall be given (1) within twelve months of the actual registration of the Lease the Commissioner of Lands shall refund to the Lessee fifty per centum of the stand premium paid in respect of the land or (2) at any subsequent time prior to the expiration of the said building period the Commissioner of Lands shall refund to the lessee twenty-five per centum of the said stand premium.
5. The land and buildings shall only be used for private dwelling house (excluding a guest house).
6. The building shall not cover more than 50 per cent of the area of the land or such lesser area as may be laid down by the Local Authority in its by-laws.

7. The Lessee shall not subdivide the land without prior written consent of the Commissioner of Lands.
8. The land and buildings shall not be used for any trade or business which the Commissioner of Lands considers to be dangerous or offensive.
9. The Lessee shall not sell, sublet, change or part with the possession of the land or any part thereof or any buildings therein except with prior consent in writing of the Commissioner of Lands. No application for consent (except in respect of a loan required for building purposes) will be considered until special condition 1.2 has been performed.
10. The Lessee shall pay to the Commissioner of Lands on demand such as the Commissioner may estimate to be proportionate cost of construction of all roads and drains and sewers serving the adjoining land and shall on completion of such construction and ascertainment of the actual proportionate share either pay (within seven days of demand) or be refunded the amount by which this proportionate cost exceeds or falls short of the amount paid as aforesaid.
11. The Lessee shall from time to time pay to the Commissioner of Lands on demand such proportion of the cost of maintaining all roads and drains serving adjoining the land as the Commissioner of Lands may assess.
12. Should the Commissioner of Lands at any time require said roads to be constructed to higher standard the lessee shall pay the Commissioner on demand such proportion of the cost of such construction as the Commissioner may assess.
13. The Lessee shall pay such rates, taxes, charges, duties assessments or outgoings of whatever description as may be imposed charges or assessed by the Government or Local Authority on the land or the building erected thereon including any contribution or other sum paid by the President of the Republic of Kenya in lieu thereof.
14. The President of Kenya or such person or authority as may be appointed for the purpose shall have the right to enter upon the land and have access to water mains service pipes and drains, telephone or telegraph wires and electric mains of all description whether overhead or underground and the Lessee shall not erect any buildings in such a way as to cover or interfere with any existing alignments of main or service pipes or telegraph wires and electric mains.
15. The Commissioner of Lands reserves the right to revise the annual ground rental payable hereunder after the expiration of the thirty-third and sixty- year of the term hereby granted. Such rental will be at a rate of four per centum of unimproved freehold value of the land as assessed by the Commissioner of Lands.

Table 1 : Type and Number of Cases of the Common Diseases Found in Maina Village in 1990

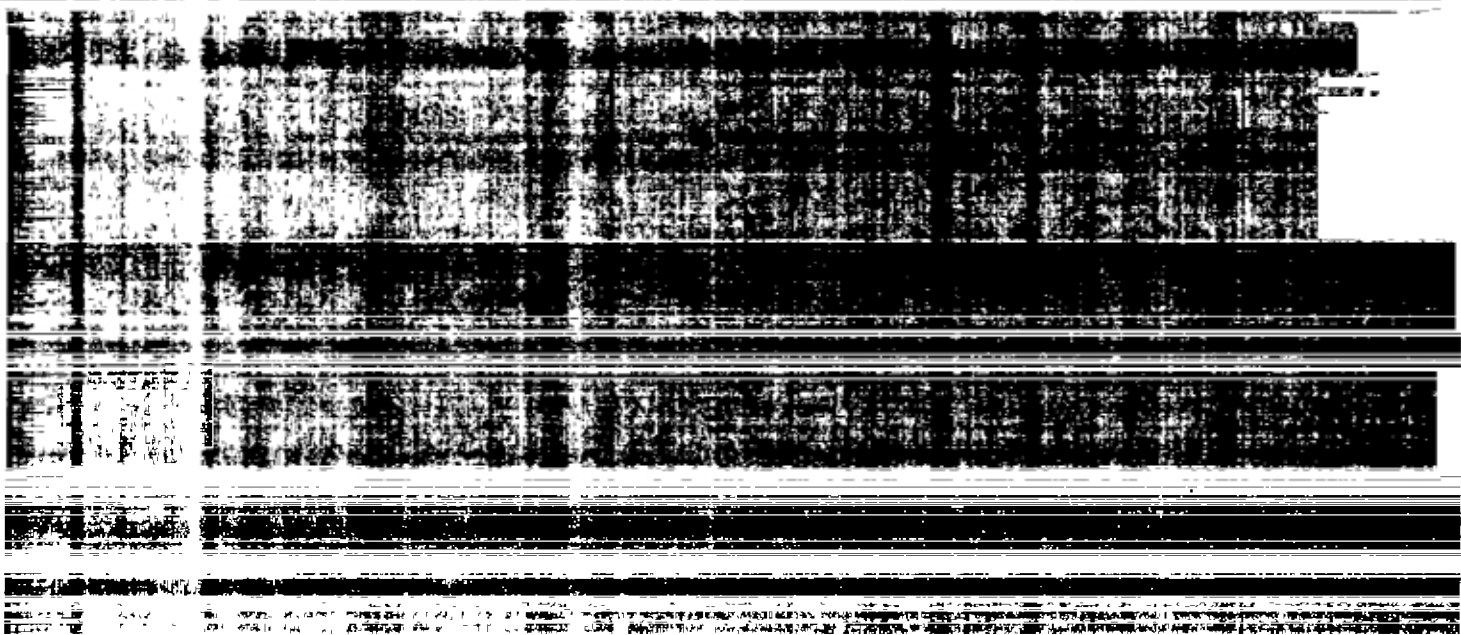
| Type of Diseases | Number of Cases per Month | | | | | | | | | | | | TOTAL |
|------------------|---------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | |
| Skin Diseases | 9 | 31 | 36 | 21 | | 30 | 25 | 38 | 95 | 84 | 38 | 32 | 403 |
| Pneumonia | 10 | 16 | 16 | 32 | 36 | 20 | 11 | 39 | 30 | 15 | 13 | 30 | 258 |
| URTI | 218 | 235 | 168 | 230 | 302 | 207 | 211 | 225 | 355 | 94 | 192 | 181 | 268 |
| Eye Infection | 20 | 11 | 4 | 13 | 15 | 20 | 13 | 6 | 13 | 14 | 17 | 27 | 173 |
| Malnutrition | 1 | | | 4 | 20 | 9 | 16 | 14 | 5 | 2 | 19 | 10 | 100 |
| Intestinal Worms | 49 | 40 | 43 | 80 | 108 | 41 | 120 | 52 | 48 | 42 | 121 | 64 | 808 |
| Gonorrhoea | 26 | 37 | 65 | 34 | 16 | 28 | 32 | 31 | 34 | 35 | 41 | 42 | 421 |
| Malaria | 240 | 210 | 278 | 229 | 276 | 160 | 200 | 245 | 118 | 386 | 208 | 202 | 2512 |
| Measles | 2 | | | | | 6 | | 5 | | | 5 | | 17 |
| Mumps | 3 | 7 | | | 3 | 8 | | | | | 4 | | 25 |
| Chicken Pox | 18 | | 3 | | | 8 | | | | | 4 | | 33 |
| Diarrhoea | 81 | 105 | 213 | 163 | 229 | 83 | 19 | 27 | 26 | 15 | 67 | 92 | 1120 |

Source: KWAHO, 1991

Table 2: Type and Number of Cases of the Common Diseases Found in Maina Village in 1991

| Type of Disease | Number of Cases per Month | | | | | | | | | | |
|------------------|---------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | TOTAL |
| Skin Diseases | 139 | 7 | 38 | 18 | 48 | 37 | | 49 | 58 | 99 | 483 |
| Pneumonia | 14 | 13 | 12 | 9 | 9 | 9 | 11 | 14 | | 15 | 106 |
| URTI | 225 | 134 | 174 | 197 | 235 | 212 | 228 | 228 | 231 | 180 | 2104 |
| Eye Infection | 10 | 7 | 7 | 14 | 24 | 15 | 22 | 42 | 49 | 12 | 209 |
| Malnutrition | 8 | 3 | 11 | 5 | 7 | 5 | 10 | 12 | 17 | 14 | 92 |
| Intestinal Worms | 60 | 96 | 100 | 46 | 111 | 41 | 51 | 105 | 137 | 127 | 874 |
| Gonorrhoea | 51 | 21 | 75 | 63 | 80 | 109 | 131 | 99 | 149 | 41 | 819 |
| Malaria | 146 | 113 | 188 | 195 | 250 | 231 | 274 | 340 | 275 | 307 | 2319 |
| Measles | 2 | | 7 | 6 | 3 | | 8 | | 5 | 6 | 37 |
| Mumps | 4 | 12 | 3 | 7 | 7 | 6 | 13 | 8 | 5 | 5 | 70 |
| Chicken Pox | | 2 | | | | | 6 | | 9 | 4 | 27 |
| Diarrhoea | 15 | 24 | 36 | 38 | 36 | 41 | 55 | 66 | 41 | 55 | 407 |

Source: KWAHO, 1991



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